APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/667,045	09/21/2000	Yifan Gong	TI-29417	8420

7590 04/13/2004	**EXAMINER**
Robert L Troike	LERNER, MARTIN
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ART UNIT	PAPER NUMBER
2654	4

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DATE MAILED: 04/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _21 September 2000_.
2a) ☐ This action is **FINAL.**   2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _1 to 9_ is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) _1 to 4_ is/are rejected.
7) ☒ Claim(s) _5 to 9_ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on _21 September 2000_ is/are: a) ☒ accepted or. b) ☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a) ☐ All   b) ☐ Some * c) ☐ None of:
       1. ☐ Certified copies of the priority documents have been received.
       2. ☐ Certified copies of the priority documents have been received in Application No. _____.
       3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

On page 2, line 10, there is a missing right parenthesis.

On page 3, line 15; page 4, line 11; and page 5, line 3, it is unclear whether the double-headed arrow is correct. Does the symbol for the double-headed arrow represent a variable, or is it a symbol for something that needs to be filled in?

On page 8, line 8, "patch" should be –path–.

Appropriate correction is required.

Claim Objections

2. Claim 9 is objected to because of the following informalities:

The variables F_l, F_h, $F(k)$, $R(k)$, α, and β are undefined. Applicants should add descriptions of the variables to clarify the claim. The Specification defines F_l and F_h as low and high frequency indices, respectively, $R(k)$ is the autocorrelation, $F(k)$ is a filter, and α, β are constants. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4.   Claims 1 to 3 are rejected under 35 U.S.C. 102(e) as being anticipated by

Anderson et al.

Regarding independent claim 1, *Anderson et al.* discloses a speech activity

detector comprising:

"a frame-level detector for making speech/non-speech decisions for each frame"

– speech detector 205 provides an initial estimate of the presence of speech in the

current frame; speech detector 205 generates an output signal when it is determined

based on a plurality of statistics that speech is strongly present in a time frame and

generates a second output sign when it is initially estimated that speech is present in a

time frame (column 6, lines 40 to 50: Figure 5); otherwise, only background noise ("non-

speech") is present;

"an utterance detector coupled to said frame-level detector and responsive to

said speech/non-speech decisions over a period of frames to detect an utterance" – the

initial estimate is then smoothed against previous frames and presented to the state

machine 260; state machine 260 receives as input the first and second output signals

from the speech detector 205; the state machine 260 provides context and memory for

interpreting the speech detector output; the state machine 260 outputs a speech activity

status signal based on the state of the state machine 260 (column 6, lines 46 to 67:

Figure 5); state machine 260 makes a final decision as to whether and what type of

speech is present based on the state of state machine 260 for previous frames (column 10, lines 1 to 41: Figure 6; Table 1).

Regarding claim 2, *Anderson et al.* discloses VAD 200 includes state machine 260 (column 6, lines 40 to 48: Figure 5).

Regarding claim 3, *Anderson et al.* discloses states include I Inactive (no speech present) ("non-speech"); C Certain speech activity (strong speech activity detected) or A Active ("in-speech"); and T Transition (transition between speech and no speech) ("pre-non-speech") (column 6, lines 62 to 67); additionally, states include transitions from an inactive state to active voice (S11), from a transition state to active voice (S13), and from inactive state to certain active state (S10) ("pre-speech") (column 10, line 1 to 41: Figure 6).

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6.   Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Anderson et al.* in view of *Krasny et al.*

Anderson et al. discloses a voice activity detector (VAD) determining the noise in an input signal from power spectral densities (PSDs) of speech and noise with a Wiener filter. (Column 4, Line 21 to Column 5, Line 55) However, *Anderson et al.* does not say

the power spectral densities are determined from an autocorrelation. *Krasny et al.* teaches a similar system and method for estimating speech signals with VAD 240, where VAD 240 operates to estimate the PSD of a frame $x_q(k)$ by autocorrelation functions $r_k(k)$, $r_s(k)$, and $r_n(k)$. (Column 4, Line 52 to Column 5, Line 36: Figure 4) It is suggested that the system and method of *Krasny et al.* has the advantage of improved performance for background noise reduction, even in low signal-to-noise situations, by estimating a power spectral density from autocorrelation functions. (Column 1, Lines 15 to 38) It would have been obvious to one having ordinary skill in the art to utilize an autocorrelation function to estimate the power spectral density (PSD) of a frame as suggested by *Krasny et al.* in the voice activity detector of *Anderson et al.* for the purpose of improved performance in background noise reduction.

Allowable Subject Matter

7.   Claims 5 to 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8.   The prior art made of record and not relied upon is considered pertinent to Applicants' disclosure.

        Isabelle, Mekuria, Handel et al., Johnson, Chu et al., Udaya Bhaskar et al., and Nemer et al. disclose related art.
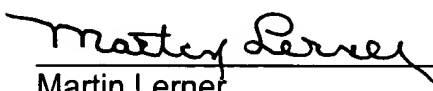
Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Martin Lerner whose telephone number is (703) 308-

9064. The examiner can normally be reached on 8:30 AM to 6:00 PM Monday to

Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Richemond Dorvil can be reached on (703) 305-9645. The fax phone

number for the organization where this application or proceeding is assigned is 703-

872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

ML
4/7/04

Martin Lerner
Examiner
Art Unit 2654